

## CONTENTS

- 1 **Overview Structural characteristics defining high barrier properties in polymeric materials**  
J. M. Lagaron, R. Català and R. Gavara
- 8 **Comparisons of deformation and fracture behaviour of PC/ABS blend and ABS copolymer under dynamic shear loading**  
W.-S. Lee and H.-C. Shen
- 16 **Noise deconvolution for area-fraction measurements**  
G. Moldovan, I. Harrison and P. D. Brown
- 21 **Theory for solute diffusion in solidifying alloy with complex interfacial geometry**  
R. S. Qin and E. R. Wallach
- 26 **Solidification of high alloy steel ingot**  
Z. Radovic and M. Lalovic
- 29 **Comparison between mechanochemical effect on die cast and extruded magnesium alloys**  
P. L. Bonora, A. Eleizer, F. Di-Gabriele, M. Andrei and E. M. Gutman
- 35 **Thermodynamic predictions of Mg-Al-M (M = Zn, Mn, Si) alloy compositions amenable to semisolid metal processing**  
Y. Q. Liu, A. Das and Z. Fan
- 42 **Creep behaviour of AZ61 magnesium alloy at low stresses and intermediate temperatures**  
V. Srivatava, K. R. McNee, G. W. Greenwood and H. Jones
- 47 **Fatigue crack initiation and early growth in a multiphase Al alloy included in a multilayer material system**  
M. R. Joyce, S. Syngellakis and P. A. S. Reed
- 57 **Synthesis and wear of Al based, free standing functionally gradient materials: effects of different reinforcements**  
S. M. L. Nai, M. Gupta and C. Y. H. Lim
- 68 **Hot compressive deformation behaviour of aluminium matrix composites with misaligned SiC whiskers**  
L. Geng, A. B. Li, J. Zhang, Z. Z. Zheng and T. Q. Lei
- 73 **Effect of particulate reinforcement on the wear behaviour of aluminium matrix composites**  
M. H. Korkut
- 82 **Superplasticity and deformation mechanisms in NiAl(-Mo) alloy**  
X. H. Du, J. T. Guo and L. Z. Zhou
- 87 **Grain coarsening in Ti-45Al based titanium aluminides at supertransus temperature and subsequent lamellar structure formation**  
U. Prasad and M. C. Chaturvedi
- 93 **Development of hardfacing material in Fe-Cr-Nb-C system for use under highly abrasive conditions**  
F. Scandella and R. Scandella
- 106 **Prediction of ferrite grain size and tensile properties of a low carbon steel**  
M. Kazeminezhad and A. Karimi Taheri
- 111 **Effect of zirconium on structure and properties of high carbon Fe-10.5 wt.% Al alloy**  
R. G. Baligidad and A. Radhakrishna
- 117 **Grain boundary segregation of phosphorus and molybdenum in a Cr-Mo low alloy steel**  
S.-H. Song, Z.-X. Yuan, D.-D. Shen, J. Liu and L.-Q. Weng
- 121 **In situ neutron diffraction during tensile straining of a fine grained ferrite-pearlite steel**  
T. Ono, Y. Tomota, P. Lukas, D. Lugovy, D. Neov, N. Tsuchida and K. Nagai
- 126 **Quantification of precipitate fraction in maraging steels by X-ray diffraction analysis**  
Z. Guo, D. Li and W. Sha
- 131 **Effects of reaction products on the bond strength of the transition joint formed between titanium and stainless steel**  
M. Ghosh, K. Bhanumurthy, G. B. Kale and S. Chatterjee
- 138 **Short communication Effect of magnesium content on microstructure and properties of Al-Cu-Mg alloys**  
B. Zlaticanin, S. Duric, B. Jordovic and B. Radonjic
- 143 **Materials perspective Classification and quantification of microstructures in steels**  
G. Thewlis
- 161 **High temperature deformation of nickel base superalloy Udimet 520**  
A. R. Mashregi, H. Monajatzadeh, M. Jahazi and S. Yue
- 167 **Effect of carbon on upper ( $\alpha+\beta$ ) phase field of Ti-5.6Al-4.8Sn-2.0Zr-1Mo-0.34Si-0.7Nd titanium alloy**  
S. Z. Zhang, G. P. Li, Q. J. Wang, Y. Y. Liu, D. Li and R. Yang
- 173 **Grain boundary characterisation in superplastic deformation of Al-Li alloy using electron backscatter diffraction**  
X. Xun, M. J. Tan and T. G. Nieh
- 181 **Simulation of constrained dendrite growth of multicomponent alloys using a Calphad method**  
R. Zhang, X. Wang, Z. Chen and W. Jie
- 185 **Precipitates, zones and transitions during aging of Al-Zn-Mg-Zr 7000 series alloy**  
V. Hansen, O. B. Karlsen, Y. Langsrud and J. Gjønnes
- 194 **Advanced light metals casting development: solidification of aluminium alloy A356**  
S. Thomson, S. L. Cockcroft and M. A. Wells
- 201 **Influence of intercritical deformation on microstructure of TRIP steels containing Al**  
S. Papaefthymiou, W. Bleck, S. Kruijver, J. Sietsma, L. Zhao and S. van der Zwaag
- 207 **Effect of Nb on grain growth of ferrite in C-Mn steel during isothermal holding after severe deformation**  
S. C. Hong, S. H. Lim, H. S. Hong, K. J. Lee, D. H. Shin and K. S. Lee

- 213 Formation of ultrafine grained microstructures in steel through strain induced transformation during single pass hot rolling  
H. Beladi, A. Zarei-Hanzaki, G. L. Kelly and P. D. Hodgson
- 221 Deformation behaviour of Fe-3Si steel  
R. Kaibyshev and I. Kazakulov
- 229 Prediction of non-uniform thinning in superplastically formed spherical domes  
J. Jeswin Vetha Jeyasingh, K. Dhananjayan, P. P. Sinha and B. Nageswara Rao
- 235 Influence of mixed mode I/III loading on fracture toughness of mild steel at various strain rates  
M. Srinivas, S. V. Kamat and P. Rama Rao
- 243 Effect of heating temperature and magnesium content on the thermal cyclic failure behaviour of ductile irons  
C. P. Cheng, T. S. Lui and L. H. Chen
- 251 Modelling of iron dissolution during hot dip galvanising of strip steel  
S. O'Dell, J. Charles, M. Vlot and V. Randle
- 257 Microstructure and wear resistance of electrodeposited RE-Ni-Mo-P-B<sub>4</sub>C-PTFE composite coating  
Z. Guo, X. Zhu and R. Xu
- 261 Development and comparison of residual stress measurement on welds by various methods  
Aruna Bahadur, B. Ravi Kumar, A. Seshu Kumar, G. G. Sarkar and J. S. Rao
- 270 Design and fabrication of polymeric micro-optical components using excimer laser ablation  
C. T. Pan and S. C. Shen
- 275 Phenomenological behaviour of long and short chain polypropylenes under tension  
A. Dasari, K. K. Tenneti, S. J. Duncan and R. D. K. Misra
- 285 Overview Mechanical properties of nanocrystalline copper and nickel  
K. S. Siow, A. A. O. Tay and P. Oruganti
- 295 Materials perspective Reduction of metal oxides using electrodeoxidation  
D. J. Fray and D. Z. Chen
- 301 M-C dipole formation in fcc (face centred cubic) Fe<sub>1-x</sub>M<sub>x</sub>C<sub>x</sub> solid solution (M=Ti,Nb)  
N. Shohei
- 307 Bond coat oxidation and its significance for life expectancy of thermal barrier coating systems  
H. Eschler, D. Renusch and M. Schütze
- 319 Stability of retained austenite in TRIP-assisted steels  
M. Y. Sherif, C. Garcia Mateo, T. Sourmail and H. K. D. H. Bhadeshia
- 323 Inferences on plastic properties and coefficient of friction during simultaneous compression deformation of dissimilar sintered powder metallurgical preforms  
B. Vamsi Krishna, P. Venugopal, and K. Prasad Rao
- 335 Constitutive modelling of carbon and alloy steels  
M. P. Phaniraj and A. K. Lahiri
- 339 Hot working of an Fe<sub>3</sub>Al based alloy  
X. Q. Yu and Y. S. Sun
- 343 Effect of carbon additions on microstructure and mechanical properties of Ti-15-3  
Z. Q. Chen, D. Hu, M. H. Loretto and X. Wu
- 350 Effect of temperature and strain rate on tensile flow and work hardening behaviour of a Ti-modified austenitic stainless steel  
P. V. Sivaprasad, S. Venugopal and S. Venkadesan
- 357 Transformation characteristics of medium carbon V-Ti-N microalloyed steel for non-quenched/tempered oil well tubes  
S. Liu, G. Liu, Y. Zhong, F. Wang, Z. Ma, Y. Zhang and J. Huang
- 363 Thermal aging of 16Cr-5Ni-1Mo stainless steel  
Part 1 - Microstructural analysis  
M. Al Dawood, I. S. El Mahallawi, M. E. Abd El Azim and M. R. El Koussy
- 370 Thermal aging of 16Cr-5Ni-1Mo stainless steel  
Part 2 - Mechanical property characterisation  
M. Al Dawood, I. S. El Mahallawi, M. E. Abd El Azim and M. R. El Koussy
- 375 Effects of thermal aging on microstructure and mechanical properties of duplex stainless steel weldments  
M. R. El Koussy, I. S. El Mahallawi, W. Khalifa, M. M. Al Dawood and M. Bueckens
- 382 Calculation of creep curves from tensile yield stress measurements on a low alloy steel  
H. D. Chandler and T. Jamiru
- 387 Evaluation of changes in X-ray elastic constants and residual stress as a function of cold rolling of austenitic steels  
Aruna Bahadur, B. Ravi Kumar and S. Ghosh Chowdhury
- 393 Microstructural evaluation of wear resistant high chromium, high carbon cast irons  
S. I. Maldonado-Ruiz, D. López, A. Velasco and R. Colás
- 399 Microstructure and mechanical properties of friction stir welded joints of AC4A cast aluminium alloy  
H. J. Liu, H. Fujii and K. Nogi
- 403 Impression creep behaviour of tin based lead free solders  
S. Devaki Rani and G. S. Murthy
- 411 Materials perspective Perspective of environmental pollution  
B. B. Argent, R. G. J. Edyvean, D. A. Spears and D. Thompson
- 431 Systematic errors in flow stress measurement for the hot plane strain compression test  
R. W. Evans and P. J. Schaming
- 441 Modelling the evolution of particle size distribution during nucleation, growth and coarsening  
J. D. Robson
- 449 Atom probe field ion microscopy study of commercial and experimental structural steels with fire resistant microstructures  
W. Sha and F. S. Kelly

- 458 **The static, dynamic and metadynamic recrystallisation of a medium carbon steel**  
S. H. Zahiri and P. D. Hodgson
- 465 **Measurements of residual strains and stresses in laser formed plates of Ti-6Al-4V using synchrotron X-ray diffraction**  
J. R. Cho, S. Tin and R. C. Reed
- 473 **Acoustic emission study of cleavage initiation in A508 steel tested in the DBTT range**  
P. Haušild, M. Karlik and F. Chmelík
- 478 **Generalised constitutive equations for densification of metal matrix coated fibre composites**  
J. Carmai and F. P. E. Dunne
- 485 **Some aspects of cold upset forming of sintered aluminium preforms using different lubricants**  
N. Selvakumar, R. Narayanasamy and K. S. Pandey
- 490 **Multistep induction heating regimes for thixoforming 7075 aluminium alloy**  
S. Chayong, H. V. Atkinson and P. Kapranos
- 497 **Effect of cooling rate on solidification characteristics of aluminum alloy AA 5182**  
S. Thompson, S. L. Cockcroft and M. A. Wells
- 505 **Influence of oxide film defects generated in filling on mechanical strength of aluminium alloy castings**  
X. Dai, X. Yang, J. Campbell and J. Wood
- 514 **Effect of Sr on primary  $\alpha$ -Fe phase in liquid Al-11.5Si-0.4Mg cast alloy**  
X. Cao and J. Campbell
- 521 **Influence of boron on the microstructure and mechanical properties of Al-11.6Si-0.4Mg casting alloy modified with strontium**  
H. Liao and G. Sun
- 528 **Application of grey-Taguchi method to optimise the drilling of aluminium alloy 6061 with multiple performance characteristics**  
M.-F. Huang and T.-R. Lin
- 533 **Application of the Taguchi method for assessment of surface treatment procedures for Ti/n-type GaN contacts**  
G. Moldovan, I. Harrison, C. J. Humphreys, M. Kappers and P. D. Brown
- 539 **Effect of beryllium and non-equilibrium heat treatment on mechanical properties of B319.0 alloy with 1.0%Fe**  
P.-S. Wang, S.-L. Lee, C. Y. Yang and J.-C. Lin
- 546 **Short communication Characteristics of intermediate temperature dynamic embrittlement of age hardenable copper-chromium alloys**  
H. Nathani and R. D. K. Misra
- 553 **Overview Contribution of multiscale materials modelling for underwriting nuclear pressure vessel integrity**  
P. E. J. Flewitt and R. Moskovic
- 567 **Characterisation of precipitation microstructures in aluminium alloys 7040 and 7050 and their relationship to mechanical behaviour**  
D. Dumont, A. Deschamps, Y. Bréchet, C. Sigli and J. C. Ehrström
- 577 **Formation of microlayers of clad residue on aluminium brazing sheet during melting and resolidification in brazing process**  
F. Gao, D. P. Sekulic, Y. Y. Qian and J. G. Morris
- 585 **Uptake of iron and its effect on grain refinement of pure magnesium by zirconium**  
P. Cao, Ma Qian, D. H. StJohn and M. T. Frost
- 593 **Effects of VIM frequency on chemical composition, homogeneity and microstructure of NiTi shape memory alloy**  
S. Badakhshan Raj and S. K. Sadrnezhad
- 599 **Grain boundary crystallography in two Fe-C-P alloys**  
G. O. Williams and V. Randle
- 605 **Method for determining the elastic modulus at grain boundaries for polycrystalline materials**  
L. Zheng and T.-D. Xu
- 610 **Measurement of autoclave thermal profiles during high pressure steam de-waxing of investment shells  
Part 1 – Vessel profiles**  
S. Jones, M. R. Jolly, S. Blackburn, J.-C. Gebelin, A. Cendrowicz and K. Lewis
- 617 **Measurement of autoclave thermal profiles during high pressure steam de-waxing of investment shells  
Part 2 – Wax body profiles**  
S. Jones, M. R. Jolly, S. Blackburn, J.-C. Gebelin, A. Cendrowicz and K. Lewis
- 623 **Quasi-static fracture toughness testing of a single CT specimen at two test conditions**  
G. Sasikala and S. K. Ray
- 627 **Numerical analysis of factors influencing Charpy impact properties in TMCR structural steels using fuzzy modelling**  
M.-Y. Chen, D. A. Linkens and A. Bannister
- 634 **Microstructure and impact behaviour of ASTM A105/AISI 304L friction weldments**  
G. Straffolini, M. Pellizzari and N. Bernardini
- 641 **Mechanical and corrosion properties of P/M-HIP super duplex stainless steel after different industrial heat treatments as used for large components**  
O. Smuk, H. Hänninen and J. Liimatainen
- 645 **Development of wear resistant medium carbon dual phase steels and their mechanical properties**  
Rajnesh Tyagi, S. K. Nath and S. Ray
- 653 **Phases and microstructure evolution in Cu-In-Cr alloys**  
J. J. Guo, C. Z. Zhao, S. P. Wu, Y. Q. Su and J. Jia
- 658 **A study of Ti/Fe contact reaction structures**  
M. F. Wu, C. Yu, Z. S. Yu and R. F. Li
- 661 **Mechanical properties of  $Ti_3SiC_2$  particulate reinforced copper prepared by hot pressing of copper coated  $Ti_3SiC_2$  and copper powder**  
Y. Zhou, B. Chen, X. Wang and C. Yan
- 666 **Microstructure and properties of Nd-Fe-B magnets prepared by spark plasma sintering**  
M. Yue, J. X. Zhang, G. P. Wang, W. Q. Liu and M. L. Zhou

- 669 **Short communication** Effect of preparation conditions on relative elongation of nickel foam  
P. S. Liu
- 673 **Short communication** Hard coatings on aluminium alloy surfaces produced using microplasma oxidation  
Y.-L. Shi, X.-Y. Zhang, F.-Y. Yan and G.-W. Xie
- 676 **Short communication** Morphology of adiabatic shear bands in cylindrical specimens of AISI 4340 steel impacted by Hopkinson pressure bar  
Q. Li, P. Zmudzki, S. Alameeri and M. N. Bassim
- 679 **Literature review** Fundamental surface science studies of automobile exhaust catalysis  
P. A. Bagot
- 695 **Microstructure–property relationships in thermomechanically processed microalloyed medium carbon steels**  
P. Zhao and J. D. Boyd
- 705 **Effect of carbon and phosphorous addition on sintered density and effect of carbon removal on mechanical properties of high density sintered steel**  
W. Khraisat and L. Nyborg
- 711 **Fabrication and characteristics of porous AISI 304L stainless steels by adding ceramic powders**  
K. Park and T. S. Lee
- 715 **Direct laser remelting of iron with addition of boron**  
X. C. Chen, J. W. Xie and P. Fox
- 720 **Evolution of precipitates, in particular cruciform and cuboid particles, during simulated direct charging of thin slab cast vanadium microalloyed steels**  
T. N. Baker, Y. Li, J. A. Wilson, A. J. Craven and D. N. Crowther
- 731 **Comparison of the green strength of warm compacted Astaloy CrM and Distaloy AE Densmix powder compacts**  
C. C. Degnan, P. H. Shipway and A. R. Kennedy
- 739 **Reactions of Co based and Fe based superalloys with a molten Zn-Al alloy**  
K. Zhang and N.-Y. Tang
- 747 **Physical basis for model with various inelastic mechanisms for nickel base superalloy**  
K. Saï, V. Aubourg, G. Cailletaud and J. L. Strudel
- 756 **Influence of 0.2 wt-%C on the aging response of Ti-15-3**  
Z. Q. Chen, D. Hu, M. H. Loretto and X. Wu
- 765 **Microstructure and mechanical properties of cast Mg-Al9Zn/SiC<sub>p</sub> composite produced by vacuum stir casting process**  
M. C. Gui, J. M. Han and P. Y. Li
- 772 **Development and validation of a processing map for AFNOR 7020 aluminium alloy**  
S. V. S. Narayana Murty, B. Nageswara Rao and B. Y. Kashyap
- 783 **Fracture toughness of selectively reinforced Al2124 alloy: precrack tip in the aluminium alloy side**  
M. T. Milan and P. Bowen
- 790 **Effect of porosity and metallic insertions on electrical resistivity of A2011 aluminium alloy**  
S. I. Bakhtiyarov and R. A. Overfelt
- 795 **Electrodeposition of poly(*o*-anisidine) coatings onto copper**  
Sonar Patil, S. R. Sainkar and P. R. Patil
- 800 **Short communication** Effect of powder characteristic on Cr internal oxidation for preparation of Cr<sub>2</sub>O<sub>3</sub>/Cu composite  
S. H. Liang, L. Fang and Z. K. Fan
- 805 **Literature review** Laser drilling of cooling holes in aeroengines: state of the art and future challenges  
C. McNally, J. Folkes and I. R. Pashby
- 814 **Tempering of hard mixture of bainitic ferrite and austenite**  
C. Garcia-Mateo, M. Peet, F. G. Caballero and H. K. D. H. Bhadeshia
- 819 **Formation of a random texture and ultrafine grains in AA 3003 during the repeated shear deformation introduced by continuous confined strip shearing**  
M. Y. Huh, J. P. Lee and J. C. Lee
- 825 **Studies on microstructural changes upon retrogression and reaging (RRA) treatment to 8090 Al–Li–Cu–Mg–Zr alloy**  
K. S. Ghosh, K. Das and U. K. Chatterjee
- 835 **Structure–property correlation of precipitation hardened AZ91 magnesium alloy**  
S. Prem Kumar, S. Kumaran and T. Srinivas Rao
- 839 **Effect of thermomechanical treatment on spray formed Cu–Ni–Si alloy**  
V. C. Srivastava, A. Schneider, V. Uhlenwinkel and K. Bauckhage
- 849 **Precipitation hardening of Cu–Ti–Zr alloys**  
R. Markandeya, S. Nagarjuna and D. S. Sarma
- 859 **Calorimetric and transmission electron microscopy studies of spray deposited Al–Zn–Mg–Cu alloys**  
E. Salamci
- 864 **Morphology and microstructure of electrodeposited Pb–Sn alloy**  
B. Sun, X.-W. Zou and Z.-Z. Jin
- 869 **Mechanical behaviour of as sprayed and sintered air plasma sprayed partially stabilised zirconia**  
H. Echsler, D. Renusch and M. Schütze
- 877 **New developments for fracture toughness determination by Vickers indentation**  
D. Chicot, A. Pertuz, F. Roudet, M. H. Staia and J. Lesage
- 885 **Impression creep behaviour of tin based lead free solders**  
S. Devaki Rani and G. S. Murthy
- 891 **Kinetics of grain boundary segregation during recrystallisation annealing**  
K. P. Boyle, Y. J. M. Bréchet, J. D. Embury and D. D. Perovic
- 897 **Effect of modified heat treatments on the microstructure and mechanical properties of low alloy high strength steel**  
A. R. Mirak and M. Nili-Ahmabadi

- 903 Dimensional change in high carbon steel wire due to heavy reduction by tandem cold drawing  
M. Akiyama, A. Taniyama, Y. Neishi and T. Hamada
- 909 Anisotropic phase transformation strain in forged D2 tool steel  
J. Wei, O. Kessler, M. Hunkel, F. Hoffmann and P. Meyr
- 915 Growth kinetics of martensitic layers during high temperature gas nitriding of a ferritic-martensitic stainless steel  
C. M. Garzón and A. P. Tschiptschin
- 919 Dynamic compressive deformation behaviour of S50C medium carbon steel  
W.-S. Lee and C.-Y. Liu
- 925 Grain refinement processes for superplastic forming of AISI 304 and 304L austenitic stainless steels  
Y. Yagodzinsky, J. Pimenoff, O. Tarasenko, J. Romu, P. Nenonen and H. Hänninen
- 931 Materials perspective Smart fluids: current and future developments  
R. Stanway
- 940 Overview Hydrogen related failure of steels – a new aspect  
M. Nagumo

---

#### Papers from 'Nanomaterials and nanomanufacturing'

- 951 Bismuth nanolines on Si(001) and their influence on mesoscopic surface structure  
J. M. MacLeod, C. P. Lima, R. H. Miwa, G. P. Srivastava and A. B. McLean
- 955 Short range and long range strain fields of Bi nanoline  
J. H. G. Owen, K. Miki and D. R. Bowler
- 959 Singh molecular precursor for synthesis of GaAs nanoparticles  
M. A. Malik, M. Afzaal, P. O'Brien, U. Bangert and B. Hamilton
- 964 Microstructural analysis of varistors prepared from nanosize ZnO  
S. C. Pillai, J. M. Kelly, D. E. McCormack and R. Ramesh
- 969 Ordering and interaction of molecules encapsulated in carbon nanotubes  
A. N. Khlobystov, K. Porfyrakis, D. A. Britz, M. Kanai, R. Scipioni, S. G. Lyapin, J. G. Wiltshire, A. Ardavan, D. Nguyen-Manh, R. J. Nicholas, D. G. Pettifor, T. J. S. Dennis and G. A. D. Briggs
- 975 Interfacial structure of annealed alumina-zirconia-silicate nanoceramics  
D. Le Messurier, N. Sissouno, A. R. Vearey-Roberts, S. Evans, D. A. Evans and R. Winter
- 980 Biocompatible gold nanoparticles  
T. R. Tshikhudo, Z. Wang and M. Brust
- 985 Modified titania nanomaterials for sunscreen applications – reducing free radical generation and DNA damage  
G. Wakefield, M. Green, S. Lipscomb and B. Flutter
- 989 X-ray diffraction detection of compliance in polyurethane-organoclay nanocomposites  
M. Song and K. J. Yao
- 993 Mechanical property optimisation of materials by nanostructuring: reduction of residual compressive stress in a ta-C film  
C.-S. Lee, K.-R. Lee and S.-H. Suh
- 996 Deformation of small volumes of material using nanostructured strained layered superlattices  
K. M. Y. P'ng, A. J. Bushby and D. J. Dunstan
- 
- 999 Superparamagnetic behaviour of nanocrystalline Ni-Zn, Zn-Mn and Ni-Mn ferrites processed by reverse micelle method  
A. Kale, H. Nathani, R. S. Srivastava and R. D. K. Misra
- 1006 Wear behaviour, durability and cyclic strength of TiC base cermets  
H. Klaasen, J. Kübarsepp and I. Preis
- 1011 Quantitative image analysis for evaluation of eutectic fractions in as cast microstructures  
B. Dutta, O. Pompe and M. Rettenmeyer
- 1019 Short term precipitation kinetics of delta phase in strain free Inconel 718 alloy  
V. Beauvois, J. Huez, S. Coste, O. Brucelle and J. Lacaze
- 1027 Liquidation of various phases in HAZ during welding of cast Inconel 738LC  
O. A. Ojo, N. L. Richards and M. C. Chaturvedi
- 1035 Influence of Widmanstatten microstructure on the constitutive equation for superplastic flow of Ti-6.4Al-2.6Mo-1.5Cr-0.4Fe-0.3Si alloy  
S. Ghosh, G. S. Murty and S. Bhargava
- 1041 Flat panel photoreactor for monitoring photodegradation  
A. J. Robinson, J. R. Searle and D. A. Worsley
- 1049 Experiments on the aging of Sn-Ag-Cu solder alloys  
L. Snugovsky, D. D. Perovic and J. W. Rutter
- 1055 Internal friction and dynamic Young's modulus of aluminium composites reinforced *in situ* with TiB<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> particulates  
K. F. Tam and S. C. Tjong
- 1059 Solid state bonding of porous nickel electrode to AISI 304 austenitic stainless steel  
K. Bhanumurthy, D. Joyson Derose, G. B. Kale and J. Krishnan
- 1064 Study of mechanisms of cold roll welding of aluminium alloy to steel strip  
H. Danesh Manesh and A. Karimi Taheri
- 1069 Growth kinetics of reaction layers formed during diffusion bonding of SiC ceramic to TiAl alloy  
H. J. Liu, J. C. Feng, H. Fujii and K. Nogi

---

## Materials in East Asia

- 1073 Editorial
- 1075 Complexes of Ca(II) with polymers as precursors for preparation of amorphous calcium phosphate  
Y. B. Li, W. J. Weng, K. Cheng, P. Y. Du, G. Shen and H. R. Han
- 1079 Zinc containing hydroxyapatite ceramics to promote osteoblastic cell activity  
Y. Sogo, A. Ito, K. Fukusawa, T. Sakurai and N. Ichinose
- 1084 Biodegradable polymeric bone cement formed from hydroxyapatite, poly (propylene fumarate), poly (vinyl pyrrolidone) and benzoyl peroxide  
Y. Abdullah, A. R. Daud, N. H. Alias, N. Kamarudin and T. C. Koon
- 1087 Effect of solid carbide particle size on deposition behavior, microstructure and wear performance of HVOF cermet coatings  
C.-J. Li, Y. Y. Wang, G.-J. Yang, A. Ohmori and K. A. Khor
- 1097 Spark plasma sintering of aluminium nitride transparent ceramics  
Z. Y. Fu, J. F. Liu, H. Wang, D. H. He and Q. J. Zhang
- 1100 Twin effects of TiB<sub>2</sub> ceramic during pulse electric current sintering  
D. M. Zhang, Z. Y. Fu, J. K. Guo and L. M. Zhang
- 1103 Development of self-lubricating titania/diamond nanoparticle composites  
K. Hanada, T. Shoji, M. Mayuzumi and T. Soni
- 1109 Development of Ni/Y<sub>2</sub>O<sub>3</sub>-ZrO<sub>2</sub> cermet anodes of solid oxide fuel cells  
S. P. Jiang and S. H. Chen
- 1119 Preparation of amorphous carbon nitride films from toluene and nitrogen by rf-PECVD  
M. Aono, K. Yamaguchi, N. Kitazawa and Y. Watanabe
- 
- 1123 Development and validation of a finite element model for hot rolling using  
ABAQUS/STANDARD  
A. Mukhopadhyay, I. C. Howard and C. M. Sellars
- 1134 Strain hardening behaviour of 316L austenitic stainless steel  
K. K. Singh
- 1143 Influence of steel strength and loading mode on the fatigue properties of resistance spot welded H beam components  
S. J. Hambling, T. B. Jones and G. Fourlaris
- 1151 Constitutive model for vanadium microalloyed steel under hot working conditions  
M. P. Phaniraj and A. K. Lahiri
- 1158 High strength and low yield ratio carbon steel bar processed by thermomechanical rolling  
H. Qiu, Y. Kawaguchi, C. Shiga, M. Enoki and T. Kishi
- 1161 Effect of solution treatment temperature on microstructure and mechanical properties of hot isostatically pressed superalloy Inconel 718  
G. Appa Rao, M. Srinivas and D. S. Sarma
- 1171 Influence of silicon content on ion nitriding of ultrahigh strength steels  
L. C. Casteletti, R. M. Muñoz Riofano and P. A. P. Nascente
- 1179 Study of surface cracking in extrusion of aluminium alloy AA 2014  
Z. Peng and T. Sheppard
- 1192 Role of nanoscale TiC particles in batch annealing of Ti stabilised interstitial free steels  
J. Shi and C. R. Liu
- 1199 Effect of titanium additions on mechanical properties of Al-Cu-Mg-Ag alloy  
D. H. Xiao, J. N. Wang and D. Y. Ding
- 1205 Microstructural characterisation of *in situ* TiB/Ti matrix composites prepared by mechanical alloying and hot pressing  
H.-B. Feng, D.-C. Jia, Y. Zhou and J. Huo
- 1211 Damping behaviour of aluminum matrix composites  
J. H. Gu, X. N. Zhang, M. Y. Gu, M. Gu and X. K. Wang
- 1215 Theory of boundary diffusion controlled grain rotation in a 'bamboo' structure  
B. Burton
- 1223 Coarsening of particulate silicon in aluminium based matrices  
H. Jones and W. M. Rainforth
- 1226 Experimental simulation of surface pitting of degraded electrodes in resistance spot welding of aluminium alloys  
Y. Zhou, S. Fukumoto, J. Peng, C. T. Ji and L. Brown
- 1233 Effect of strain rate and thermal history on the constitutive behaviour of Al-Mg alloy AA 5182  
W. M. van Haaften, W. H. Kool and L. Katgerman
- 1237 Effect of minor cerium additions on microstructure and mechanical properties of cast Al-Cu-Mg-Ag alloy  
D. H. Xiao, J. N. Wang and D. Y. Ding
- 1241 Fatigue characteristics of plasma treated aluminium repaired by graphite/epoxy composite patch  
K. Y. Rhee, S. H. Jang and S. J. Park
- 1245 Quantitative metallography of sigma phase precipitates in AISI 347 stainless steel – a comparison between different methods  
J. Erneman, L. Nylöf, J.-O. Nilsson and H. O. Andrén
- 1252 Low temperature synthesis of Ti<sub>3</sub>SiC<sub>2</sub> from Ti/SiC/C Powders  
Z. F. Zhang, Z. M. Sun and H. Hashimoto
- 1257 Analysis of high flow stress and microstructural evolution of TC6 titanium alloy during isothermal forging  
A.-M. Xiong, M.-Q. Li, W.-C Huang, S.-H Chen and H. Lin

- 1261 Deformation behaviour and new constitutive equation considering the grain size of commercial TC6 titanium alloy  
M. Q. Li, A. M. Xiong, H. R. Wang, S. B. Su and L. C. Shen
- 1266 Isothermal and thermomechanical fatigue behaviour of a high temperature titanium alloy  
J. R. Liu, S. X. Li, D. Li and R. Yang
- 1273 Velocity and radius transients during pressure mediated dendritic growth of succinonitrile  
P. Kar, J. C. LaCombe and M. B. Koss
- 1281 Texture evolution in two phase Zr-2.5 wt-%Nb through modified route  
K. Kapoor, D. Lahiri, S. V. R. Rao, T. Sanyal, N. Saibaba and B. P. Kashyap
- 1290 Prediction of creep life of X10CrMoVNbN-91 (P-91) steel through short term stress relaxation test methodology  
S. C. Bose, Kulvir Singh, J. Swaminathan and D. S. Sarma
- 1297 Formation of aluminide coatings on low alloy steels at 650 °C by pack cementation process  
Z. D. Xiang and P. K. Datta
- 1303 Determination of elastic constants from measured natural frequencies of specially orthotropic cantilever plates  
K. G. Muthurajan, K. Sankaranarayanasamy, S. B. Tiwari and B. Nageswara Rao
- 1310 Effect of variation of strain rate on thermal and acoustic emission during tensile deformation of nuclear grade AISI type 316 stainless steel  
B. Venkataraman, C. K. Mukhopadhyay and Baldev Raj
- 1317 Predicting microstructural evolution and yield strength of microalloyed hot rolled steel plate  
A. P. Singh, D. Sengupta, S. Jha, M. P. Yallasiri and N. S. Mishra
- 1326 Microstructure and abrasive wear behaviour of iron base hardfacing  
D. K. Dwivedi
- 1331 Non-monotonic behaviour of tool life function as explained by fuzzy set theory  
M. Miernik
- 1335 A discussion of the scaling effect in numerical simulation of the extrusion process  
Z. Peng, T. Sheppard and X. Velay
- 1340 Preparation, characterisation and computational study of poly( $\epsilon$ -caprolactone) based nanocomposites  
M. Avella, F. Bondioli, V. Cannillo, M. E. Errico, A. M. Ferrari, B. Focher, M. Malinconico, T. Manfredini and M. Montorsi
- 1345 Fabrication of ultrafine W–Cu powders by mechanical alloying  
S. B. Li, J. X. Xie and Z. Y. Zhao
- 1351 Microstructure and strength of TiC cermet/cast iron brazed with Ag–Cu–Zn filler metal  
L. X. Zhang, J. C. Feng, B. Y. Zhang and H. J. Liu
- 1355 Comments on the paper 'Systematic errors in flow stress measurement for the hot plane strain compression test' by R. W. Evans and P. J. Schaming  
A. J. Lacey, S. Mirza and C. M. Sellars
- 1357 Literature review Understanding mechanisms of grain refinement of aluminium alloys by inoculation  
T. E. Quested
- 1370 Influence of processing parameters on superplasticity of friction stir processed nugget in high strength Al–Cu–Li alloy  
M. M. Attallah and H. G. Salem
- 1377 The effect of boundary spacing on substructure strengthening  
E. Nes, K. Marthinsen and B. Holmedal
- 1383 Development of high performance magnesium nanocomposites using solidification processing route  
S. F. Hassan and M. Gupta
- 1389 Effect of presence of SiC and operating frequency on damping behaviour of pure magnesium  
N. Srikanth, D. Saravananathan and M. Gupta
- 1397 Microstructural evolution of AZ61 magnesium alloy during hot deformation  
H. T. Zhou, X. Q. Zeng, L. L. Liu, J. Dong, Q. D. Wang, W. J. Ding and Y. P. Zhu
- 1403 Solidification of ternary eutectic and near eutectic alloys in the Ag–Cu–Sn system  
L. Snugovsky, D. D. Perovic and J. W. Rutter
- 1414 Modelling hot deformation of Inconel 718 using state variables  
X. Zhao, R. P. Guest, S. Tin, D. Cole, J. W. Brooks and M. Peers
- 1421 TEM study of nanopores and the embrittlement of CVD nickel foam  
G. J. C. Carpenter, Z. S. Wronski and M. W. Phaneuf
- 1427 Surface properties of bio-implant Nitinol modified by ECR cold plasma  
J. Yang, J. Wang and S. Tong
- 1431 Relative importance of the transformation temperatures and sulphur content on hot ductility of steels  
A. Cowley and B. Mintz
- 1440 Formation of sulphide 'patches' on inclusions in C–Mn steel weld metal  
P. Miao and J. F. Knott
- 1447 Transition from upper to lower bainite in Fe–C–Cr steel  
Z. Lawrynowicz
- 1455 Improvement of creep strength by fine distribution of TiC in 9Cr ferritic heat resistant steel  
M. Taneike, N. Fujitsuna and F. Abe
- 1462 Densification and microstructural evaluation during laser sintering of M2 high speed steel powder  
H. Simchi and H. Asgharzadeh
- 1469 Critical condition for dynamic recrystallisation of high carbon steels  
A. M. Elwazri, P. Wanjara and S. Yue
- 1474 Effect of bonding time on joint properties of vacuum brazed WC–Co hard metal/carbon steel using stacked Cu and Ni alloy as insert metal  
W.-B. Lee, B.-D. Kwon and S.-B. Jung

- 1479 **Joint evolution and strengthening mechanisms in arc brazed galvanised steels with Cu<sub>97</sub>Si<sub>3</sub> filler**  
Z. S. Yu, R. F. Li, F. M. Zhou, M. F. Wu, K. Qi and Y. Y. Qian
- 1484 **Technology and interface structure for diffusion bonding of Fe<sub>3</sub>Al/18-8 dissimilar materials**  
Y. J. Li, J. Wang, Y.-S. Yin and H.-J. Ma
- 1489 **Modelling of behaviour of oxide film during vibration diffusion bonding of SiC<sub>p</sub>/A356 composite in air**  
J. C. Yan, H. B. Xu, Z. W. Xu, L. Ma and S. Q. Yang
- 1493 **Formation of zinc oxide nanoparticles by mechanochemical reaction**  
H. M. Yang, X. C. Zhang, A. D. Tang and W. Q. Ao
- 1496 **Production of MgAl<sub>2</sub>O<sub>4</sub>-Ti(C,N) composite ceramics by aluminothermic reduction in reducing atmosphere**  
Y. B. Li, N. Li, G. Z. Ruan and X. H. Li
- 1499 **Bainite formation influenced by large stress**  
K. Hase, C. Garcia-Mateo and H. K. D. H. Bhadeshia
- 1506 **Comparison of different methods to measure strain induced  $\alpha'$ -martensite content in austenitic steels**  
J. Talonen, P. Asporen and H. Hänninen
- 1513 **Grain rotation from cavity sintering**  
B. Burton
- 1519 **Effect of long term service at high temperature on the properties of type P-22 steel**  
S. Perets, A. Arbel, S. Ariely, A. Venkert and R. Z. Shneck
- 1525 **Analysis of steady state creep behaviour of 9–12% chromium ferritic-martensitic steels**  
G. Dimmler, P. Weinert and H. Cerjak
- 1531 **Initiation fracture toughness of HSLA steel through automatic measurement of stretch zone**  
M. Tarafder, Swati Dey, B. Dash, S. Sivaprasad and S. Tarafder
- 1538 **Microstructural evolution of ultrafine grained structure in plain carbon steels through single pass rolling**  
H. Beladi, G. L. Kelly and P. D. Hodgson
- 1545 **Processing parameters for the mechanical working of 9Cr-1Mo steel: processing maps approach**  
P. V. Sivaprasad, S. L. Mannan and Y. V. R. K. Prasad
- 1551 **Effect of welding technique on weld morphology and hardness of supermartensitic 13%Cr steels**  
V. Neubert, J. Reuter, N. El-Mahallawy, H. Hoffmeister and R. Hoffmann
- 1563 **Evaluation of effect of magnetostriction on residual stress relief by pulsed magnetic treatment**  
Z. P. Cai, J. A. Lin, L. A. Zhou and H. Y. Zhao
- 1567 **Numerical simulation of quenching of large sized blocks of 718 steel used for plastic dies**  
D.-L. Song, J.-F. Gu, J.-S. Pan and M.-J. Hu
- 1573 **Effect of thermal aging of 16Cr-5Ni-1Mo precipitation hardening stainless steel**  
R. Abdel-Karim, M. M. Al Dawood, I. S. El Mahallawi
- 1578 **Evolution of interface microstructure and strength properties in titanium-stainless steel diffusion bonded transition joints**  
M. Ghosh, A. Laik, K. Bhanumurthy, G. B. Kale, J. Krishnan and S. Chatterjee
- 1585 **Modelling the effects of process variables on thermal behaviour during high speed resistance welding of tinplate**  
S. G. R. Brown and B. S. Suthar
- 1590 **Controlled synthesis of microarc oxidation coating on Ti6Al4V alloy and its antifriction properties**  
Y. M. Wang, B. L. Jiang, L. X. Guo and T. C. Lei
- 1595 **Transient liquid phase bonding of magnesium alloy (Mg-3Al-1Zn) using copper interlayer**  
D. Q. Sun, W. H. Liu and X. Y. Gu
- 1599 **Toughness and fatigue behaviour of eutectic and hypereutectic Al-Si-Cu-Mg alloys produced through lost-foam and squeeze casting**  
L. Lasa and J. M. Rodriguez-Ibanez
- 1609 **Thermography during laser surface melting of cast aluminium alloy**  
S. Nayak, H. Wang and N. B. Dahotre
- 1615 **Foaming behaviors of Al-Si-Cu-Mg alloys**  
A. Kim, S. Cho, H.-J. Lee
- 1621 **Deformation and fracture behaviors of porous FVS0812 aluminium alloys prepared by spray deposition**  
Z. H. Chen, M. Y. Zhan and W. J. Xia
- 1627 **DSC and HRTEM investigation of the precipitates in Al-1.0%Mg2Si-0.5%Ag Alloy**  
A. Gaber, K. Matsuda, A. M. Ali, Y. Zou and S. Ikeno
- 1632 **Microstructure and wear characteristics of spray formed and hot extruded Al-Si alloys**  
V. C. Srivastava and S. N. Ojha
- 1639 **Structure evolution in annealed and hot deformed Al-V<sub>2</sub>O<sub>5</sub> composites**  
L. Blaz, Z. Sierpinska, M. Tumidajewicz, J. Kaneko and M. Sugamata
- 1645 **Tensile behaviour and ductility of 10 vol.-% Saffil short fibre reinforced aluminium**  
R. Tavangar, S. Nategh and L. Weber
- 1649 **Optimising removal rate and reliability of polishing of ceramic blocks using a combination of Taguchi and grey methods**  
T.-R. Lin, H.-C. Chu and M.-F. Huang
- 1655 **Influence of fibre surface oxidation treatment on mechanical interfacial properties of carbon fibre/polyarylacetylene composites**  
H. J. Fu, Y. D. Huang and L. Liu
- 1661 **Short communication Microstructure and mechanical properties of extruded ZK60 magnesium alloy containing rare earth**  
C. J. Ma, M. Liu, G. H. Wu, W. J. Ding and Y. P. Zhu
- 1666 **Short communication Vacuum diffusion bonding of TiB<sub>2</sub> cermet to TiAl based alloys**  
Z. R. Li, J. C. Feng and J. Cao
- 1669 **Conference diary**

## Conference diary

pages 141, 409, 551, 804, 930, 1669

